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*"Welcome Shelter Near Trail's End"*

FEDERAL-STATE COOPERATIVE  
SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

COLORADO RIVER DRAINAGE BASIN

MAY 1, 1947

By

Division of Irrigation, Soil Conservation Service  
United States Department of Agriculture  
and  
Colorado Agricultural Experiment Station

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Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.



May 1, 1947

WATER SUPPLY OUTLOOK

COLORADO RIVER DRAINAGE

It is estimated that the summer flow of the Colorado River into Lake Mead will be near the past ten-year average.

Snow cover on the headwaters of the Colorado and its tributaries in Colorado, as shown by snow surveys, April 1 and May 1, is well above normal and much above May 1, 1946. However, the water supply situation on streams originating in southwestern Colorado is not so favorable. The flow of the Animas will be slightly below normal and the flow of the San Juan and Dolores will be decidedly deficient. April precipitation ranged from above normal in northern Colorado and the Green watershed in Wyoming to a deficiency in southern Colorado, New Mexico and Arizona. Drought conditions continue in Arizona. Reservoir storage is extremely low.

COLORADO RIVER AND  
TRIBUTARIES IN COLORADO

Colorado River (Above Grand Junction). Snow cover on the Colorado River watershed above Grand Junction is now 133 percent of normal, 276 percent of last year as of May 1. Snow cover is unusually high on courses located on the watershed of the Blue River. The summer discharge in this stream will be some higher than indicated on April 1. Precipitation in valley areas has been normal or slightly above. Stream flow was normal for April but the streams were rising at the end of April and first of May. Range and crop conditions are reported as good.

Gunnison River. The outlook for water supply on the Gunnison is practically unchanged since April 1. The summer flow will be nearly twice as great as for the 1946 season. Precipitation at lower elevations has been generally sub-normal. Range conditions are poor but crops in irrigated areas are generally good. The flow of the Gunnison during April was about 65 percent of normal but has increased substantially the past few days. Storage in Taylor Park reservoir is now 68,000 acre-feet as compared to 91,000 on May 1, 1946.

Yampa and White Rivers. Snow on the watershed of the Yampa River is now 23 percent above normal and much above last year. Precipitation throughout the winter season has been above normal. The summer flow of this stream should be well above average. Soil moisture is reported as good and stream flow about normal. Crop conditions are very good but grain planting is delayed. The snow cover on the headwaters of the White River is 42 percent above normal. This and other conditions indicate a heavy summer runoff for this stream. Range and crop conditions in the Meeker area are reported from fair to good. The summer discharge of the Elk and Little Snake Rivers will be above normal and much above last year.



San Juan and Animas Rivers. During the month of March a decided deficiency in snow cover developed on the headwaters of the San Juan River. There was a moderate decrease in snow water content during April. The water supply outlook is about the same as of April 1 which is much better than last year. The summer discharge of the San Juan at Rosa, New Mexico is estimated to be nearly 55 percent of normal. On the Los Pinos River the low snow has been gone for more than a month and precipitation has been 70 percent of normal. Vallecito reservoir now holds in storage 66,000 acre-feet as compared to 59,000 on May 1, 1946. On the Animas River the water content is 75 percent of average. The estimate of the summer discharge of the Animas at Durango is decreased to 450,000 acre-feet. At Durango, April precipitation was below normal. Soil moisture conditions are good. The range and crop outlook is fair to good.

Dolores River. As in other areas in southwestern Colorado the snow cover on the Dolores watershed is deficient. There is no snow at lower elevations. At Lizard Head the snow water content is 75 percent of average. The summer discharge of this stream will be nearly 225,000 acre-feet at Dolores, which is better than the 1946 season. The surface soil is dry and range and crop conditions are described as fair. Stream flow is normal. Storage in Groundhog and Narraquinepp reservoirs now totals 22,000 acre-feet.

#### GREEN RIVER IN WYOMING

The estimates of summer discharge from the Green River watershed in Wyoming is somewhat above that of April 1. The average snow water content of the Green River courses is 58 percent above normal and 148 percent above May 1, 1946. However, the weather has been cold and snow melt is retarded at higher elevations. Precipitation is reported as above normal. Stream flow is reported as above normal. Range and crop progress is retarded. The discharge of the Green River at Linwood, Utah is expected to be 1,200,000 acre-feet during the April-September period.

#### COLORADO RIVER AND TRIBUTARIES IN ARIZONA

The drought conditions of the past two winter seasons continue. No snow courses have been measured since April 1 when no snow was reported on any of the established courses. Precipitation throughout the winter season has been definitely sub-normal and recent precipitation has been negligible. The flow of the Gila River is the lowest of record. Soil moisture conditions are reported as dry. In the Salt River Valley there is some feed available on the lower ranges and crop conditions are good. Storage in the four major reservoirs in the Salt River valley now totals 386,500 acre-feet, as compared to 557,000 a year ago. San Carlos Reservoir was empty on April 26, 1947. The drop in ground-water levels in the Salt River Valley that started in 1942 continued through 1946. Ground-water levels are now at record low stage.

Storage in Lake Mead is 16,283,000 acre-feet or 1,580,000 acre-feet under May 1, 1946.

## COLORADO RIVER DRAINAGE BASIN

## STREAM FLOW FORECASTS, May 1, 1947

Basin and Stream	April-Sept., Incl, Streamflow Thousands Acre Feet				10-year avg. 1935-1945
	Forecast 1947	Measured Runoff		1944	
		1946	1945		
<u>GREEN</u>					
Green at Linwood, Utah	1,200,000	1,181,000	1,092,640	1,282,000	1,129,000
Little Snake at Lilly	400,000	---	447,000	365,000	351,000
Elk at Clark	225,000	---	226,000	197,000	215,000
Yampa at Steamboat Springs	290,000	---	286,000	215,000	263,000
White at Meeker	350,000	248,000	354,000	293,000	276,000
<u>COLORADO</u>					
Colorado at Glenwood Springs	1,750,000	1,148,000	1,402,000	1,186,000	1,481,000
Roaring Fork at Glenwood Springs	800,000	635,000	750,000	730,000	742,000
Blue above Green Mountain Res	250,000	---	---	---	---
Gunnison at Grand Junction	1,700,000	906,000	1,457,000	1,879,000	1,520,000
Uncompahgre at Colona	175,000	110,000	174,000	227,000	176,000
San Juan at Rosa, N. M.	400,000	---	---	838,000	786,000
Los Pinos Near Bayfield	160,000	---	---	322,000	248,000
Animas at Durango	450,000	340,000	465,000	681,000	518,000
Dolores at Dolores	225,000	194,000	306,000	422,000	359,000
San Miguel at Naturita	250,000	133,000	---	341,000	306,000
Colorado near Grand Canyon	10,000,000	6,505,000	9,562,000	11,045,000	10,006,000

# SNOW SURVEYS AND IRRIGATION WATER FORECASTS

## COLORADO RIVER BASIN

### STATUS OF RESERVOIR STORAGE, MAY 1, 1947

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous. A. Ft.)	THOUSANDS OF ACRE FEET IN STORAGE					May 1, 1947	Forecast	
			About May 1							
			1947	1946	1945	1944	10-yr. Avg. 1936-45	% Cap.	% Avg. Capacity	
COLORADO DRAINAGE	Taylor Park	106.2	68.0	90.9	65.4	88.4	61.7	64	110	100
	Los Pinos River	126.3	66.2	58.7	19.3	38.2	32.7	54	201	55
	Groundhog Creek	21.7	12.0	8.0	8.0	41.3	10.2	55	118	70
	Blue River	146.9	61.0	56.2	49.6	41.3	49.7	42	123	45
	Colorado River	27935.0	16283.0	17863.0	20975.0	22268.0		58		80
	Colorado River	688.0	657.6	--				96		--
SALT AND GILA DRAINAGE	Roosevelt	1381.5	44.4	299.8	788.4	914.6	767.8	3	6	--
	Salt River	245.1	237.5	223.8	239.1	237.6	217.4	97	110	--
	"	57.8	47.3	48.1	52.7	49.8	46.4	82	102	--
	"	69.8	57.3	45.2	60.4	54.8	53.0	82	108	--
	Verde River	179.5	0	9.3	120.7	148.0	98.4	0	0	--
	Aqua Fria River	173.0	0.4	3.6	27.4	34.6	47.7			--
	Gila River	1200.0		14.7	122.9	243.0	292.4	0	0	--
										--

\*Some for shorter periods



## SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

## COLORADO RIVER BASIN

May 1, 1947

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS  
BY WATERSHEDS

WATERSHEDS	Snow Depth		Water Content		Number Courses in Average	Snow Density		1947 Water Content in percent of	
	Twelve year Avg.*	1946	1947	Twelve year Avg.*		1946	1947	Twelve year Avg.*	1946
	In.	In.	In.	Percent		Percent	Percent	Percent	
COLORADO RIVER	In.	In.	In.	In.		Percent	Percent		
Colorado River**	35.6	16.9	45.8	6.1	21	35	36	133	276
Yampa River	32.3	9.0	40.0	4.0	4	42	44	123	417
White River	30.8	10.3	44.4	3.7	2	40	36	142	470
Roaring Fork	25.3	12.1	33.5	5.1	3	37	42	144	262
Gunnison River	37.2	16.0	42.3	5.8	10	37	36	118	280
Uncompahgre River	25.3	0.0	28.8	0.0	1	38	---	113	--
Dolores River	17.0	7.9	11.9	3.0	3	36	38	61	123
San Juan River	29.1	11.8	18.8	7.4	5	43	41	59	151
Animas River	12.9	0.0	9.6	0.0	3	37	---	75	--
Green River	19.0	10.6	30.6	4.6	6	38	43	158	248

\*\*Above Grand Junction \*Some for shorter periods.

## P R E C I P I T A T I O N   D A T A

WATERSHED	STATE	Precipitation*		Departure from Normal		Precipitation*		Departure from Normal	
		Precipitation* October 1 to April 30	Inches	Precipitation* April	Inches	Precipitation* April	Inches	Precipitation* April	Inches
Colorado	Colorado	10.92	10.92	1.53	1.53	1.53	-0.24	1.53	-0.24
Green	Wyoming	7.75	7.75	2.12	2.12	2.12	+0.51	2.12	+0.51
San Juan	New Mexico	3.14	3.14	2.56	2.56	2.56	-0.65	2.56	-0.65
Colorado	Arizona	4.93	4.93	3.64	3.64	3.64	-0.82	3.64	-0.82
Gila	New Mexico	2.87	2.87	2.61	2.61	2.61	-0.36	2.61	-0.36

The accumulated precipitation since October 1 over the watershed of the Colorado River was below normal except on the Green River drainage in Wyoming. April precipitation also, was above normal on the Green River drainage. In all other areas, it was below normal.

\*Precipitation tentative

## COLORADO RIVER SNOW SURVEYS, May 1, 1947

DRAINAGE BASIN and SNOW COURSE		LOCATION			SNOW COVER MEASUREMENTS											
					No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)			Years of Record	Past Record Av. Water Content (Inches)
1947	1946	1945														
COLORADO RIVER																
COLORADO RIVER (Above Grand Junction)																
Park View*	7 Colo.	24	5N	78W	9200	4/30	32.7	10.2	2.6	9.7	12	7.3				
Phantom Valley	12 "		5N	75W	9300	4/30	27.6	10.4	0.0	9.9	12	5.7				
Berthoud Pass	16 "		2S	75W	9700	5/1	53.7	20.3	5.3	12.7	12	14.5				
Tennessee Pass*	19 "		8S	80W	10200	5/1	30.5	8.6	0.0	6.5	12	5.1				
Ind. Pass Tunnel	33 "		11S	82W	10200	4/28	62.3	27.4	15.2	20.4	12	16.8				
N. Lost Trail Cr.	34 "		11S	87W	9200	4/30	31.0	10.6	0.0	17.5	12	10.1				
M. Fork Camp Gr.	37 "		3S	77W	9000	5/1	32.4	10.7	0.0	8.5	12	5.4				
Fiddler Gulch	44 "		8S	80W	11000	4/30	54.0	19.5	--	14.8	11	14.2				
Nast	45 "		9S	83W	8700	4/30	7.3	2.3	0.0	1.4	12	1.1				
Mesa Lakes	56 "		11S	96W	10000	4/30	47.0	18.5	4.5	23.0	11	16.2				
Lulu	59 "		6N	76W	10200	5/3	52.5	21.6	12.2	19.6	8	18.9				
Willow Creek P.	62 "		4N	78W	9500	4/30	45.9	16.1	5.0	15.0	10	12.4				
N. Inlet Grand L.	64 "		4N	75W	9000	4/27	34.8	10.9	0.0	13.0	10	7.8				
Lake Irene	65 "		5N	75W	10600	4/29	71.3	27.1	15.2	26.8	10	23.3				
Thunderbolt Peak	66 "		2N	74W	9500	4/30	42.7	15.3	9.7	15.2	10	14.3				
Arrow	69 "		1S	75W	9900	5/1	33.0	11.2	0.0	11.5	10	7.0				
Lapland	70 "		2S	76W	9300	4/29	41.6	13.1	0.4	10.7	10	7.4				
Fremont Pass #2	79 "		8S	79W	11400	4/30	66.9	22.0	13.0	15.6	12	16.8				
Trickle Divide	85 "		11S	94W	10000	4/30	81.1	33.5	19.9	36.8	8	30.8				
Lynx Pass No. 2	91 "		2N	83W	9100	4/29	39.6	16.0	0.7	12.9	12	8.4				
Shrine Pass	96 "		6S	79W	10500	4/30	66.1	23.2	12.8	18.1	6	17.0				
Grizzly Peak	97 "		5S	76W	11250	4/30	64.1	23.0	11.9	18.9	6	18.2				
Ivanhoe	100 "		9S	82W	10400	5/3	50.5	19.7	8.9	--	2	14.3				
Glen-Mar Ranch	102 "		12S	77W	8850	5/1	26.7	8.6	--	--	1	--				
Average for drainage							45.8	16.8	6.1	15.6		12.6				
YAMPA RIVER																
Dry Lake	6 Colo.	26	7N	84W	8200	4/30	36.2	18.5	0.0	22.9	12	14.8				
Columbine Lodge*	8 "		5N	82W	9300	5/1	48.0	20.0	10.9	25.5	12	18.8				
Elk River	9 "		10N	85W	8700	4/29	36.4	12.4	4.6	23.9	12	12.2				
Lynx Pass No. 2*	91 "		2N	83W	9100	4/29	39.6	16.0	0.7	12.9	12	8.4				
Average for drainage							40.0	16.7	4.0	21.3		13.6				
WHITE RIVER																
Burro Mountain	35 Colo.	15	2S	91W	9000	5/1	54.1	20.3	6.1	21.6	12	15.1				
Rio Blanco	36 "		1N	88W	8500	5/1	34.6	14.5	1.3	17.4	12	9.3				
Average for drainage							44.4	17.4	3.7	19.5		12.2				
*On adjacent drainage																

\*On adjacent drainage

DRAINAGE BASIN and SNOW COURSE	No. and State	Sec.	Twp. Lat.	Range Long.	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)			Years of Record	Av. Water Content (Inches)
								1947	1946	1945		
COLORADO RIVER												
ROARING FORK	33 Colo.	30	11S	82W	10200	4/28	62.3	27.4	15.2	20.4	12	16.8
Ind. Pass Tunnel	34 "	20	11S	87W	9200	4/30	31.0	16.6	0.0	17.5	12	10.1
N. Lost Trail Cr.	45 "	1	9S	83W	8700	4/30	7.3	2.3	0.0	1.4	12	1.1
Nast	100 "	12	9S	82W	10400	5/3	50.5	19.7	8.9			
Ivanhoe				Average for drainage			33.5	13.4	5.1	13.1		9.3
GUNNISON RIVER	18 Colo.	22	13S	86W	9000	5/1	22.5	12.0		13.1	12	6.4
Crested Butte	42 "	24	48N	6E	10800	4/29	39.6	12.1	1.9	16.1	12	10.3
Marshall Creek	43 "	19	48N	7E	10500	4/29	33.0	11.1	1.3	15.1	12	8.4
Poncha Creek*	46 "	19	14S	82W	9700	5/1	26.2	9.0	1.0	--	11	3.8
Park Cone	53 "	2	12S	95W	10000	4/30	68.5	25.8	12.4	29.4	11	24.2
Alexander Lake	55 "	14	13S	89W	7500	4/28	0.0	0.0	0.0	4.8	11	0.7
Snowshoe Mesa	58 "	29	43N	7W	9800	4/30	28.8	10.7	0.0	13.5	11	9.5
Ironton Park	85 "	23	11S	94W	10000	4/30	81.1	33.5	19.9	36.8	8	30.8
Trickle Divide	87 "	34	11S	94W	9500	4/30	68.4	28.7	13.8	32.7	8	26.7
Park Reservoir	89 "	19	49N	6E	10800	4/30	54.6	18.9	7.6	20.5	8	17.2
Porphyr Creek	94 "	35	44N	6W	10200		--	--	2.1	9.5	--	--
Sunshine Mt. No. 2	101 "	5	12S	95W	10700	4/29	74.0	29.3	--	--	1	--
Kannah Creek				Average for drainage			42.3	16.2	5.8	19.8		13.8
UNCOMPAHGRE RIVER	58 Colo.	29	43N	7W	9800	4/30	28.8	10.7	0.0	13.5	11	9.5
Ironton Park												
SAN JUAN RIVER	26 Colo.	4	37N	2E	10000	4/29	44.8	17.5	10.6	37.0	12	26.0
Wolf Creek. Pass*	29 "	10	37N	1E	10000	4/29	49.2	19.7	14.1	39.6	12	30.1
Upper San Juan	30 "	10	41N	7W	9400	4/30	0.0	0.0	0.0	T	12	1.5
Silverton Sub.S.	31 "	12	39N	9W	8850	4/30	0.0	0.0	0.0	5.5	12	3.4
Cascade	93 "	24	37N	6W	7950	5/1	0.0	0.0	0.0	0.0	7	1.3
Granite Peaks				Average for drainage			18.8	7.4	4.9	16.4		12.5

\*On adjacent drainage

\*On adjacent drainage



## COLORADO RIVER SNOW SURVEYS, May 1, 1947

## SNOW COURSE MEASUREMENTS

## LOCATION

DRAINAGE BASIN and SNOW COURSE	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)			Years of Record	Past Record Av. Water Content (Inches)
								1947	1946	1945		
COLORADO RIVER												
DOLORES RIVER												
Rico	23 Colo.	11	39N	11W	8700	5/2	0.0	0.0	0.0	1.1	12	1.4
Telluride	24 "	6	42N	8W	8600	4/30	0.0	0.0	0.0	2.4	12	1.6
Lizard Head	25 "	24	41N	10W	10300	5/2	35.8	11.1	9.0	19.1	12	15.3
			Average for drainage				11.9	3.7	3.0	7.5		6.1
ANIMAS RIVER												
Silverton SS.	30 Colo.	10	41N	7W	9400	4/30	0.0	0.0	0.0	T	12	1.5
Cascade	31 "	12	39N	9W	8850	4/30	0.0	0.0	0.0	5.5	12	3.4
Ironton Park**	58 "	29	43N	9W	9800	4/30	28.8	10.7	0.0	13.5	11	9.5
			Average for drainage				9.6	3.6	0.0	6.3		4.8
GREEN RIVER												
Dutch Joe R.S.	23 Wyo.	33	31N	104W	8700	4/30	16.7	5.9	0.0	6.7	12	3.4
Mulligan Park	24 "	17	35N	108W	8900	4/30	34.0	11.7	1.2	8.9	12	6.3
Kendall R.S.	25 "	23	38N	110W	7900	4/29	31.3	9.8	2.7	6.6	12	5.0
Loomis Park	26 "	14	37N	111W	8500	5/1	30.1	13.5	3.8	7.5	12	9.2
Snyder Basin R.S.	27 "	15	29N	114W	8040	4/28	28.0	10.7	8.6	11.0	12	6.8
Piney La Barge	28 "	19	29N	114W	8820	4/28	43.2	16.6	11.0	16.8	12	12.5
			Average for drainage				30.6	11.4	4.6	9.6		7.2

\*On adjacent drainage



The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

#### STATE

Colorado State Engineer  
Wyoming State Engineer  
Utah State Engineer  
New Mexico State Engineer  
Montana State Engineer  
Nebraska State Engineer  
Colorado Experiment Station  
Colorado Extension Service  
Montana Experiment Station  
Utah Experiment Station

#### FEDERAL

Department of Agriculture  
Forest Service  
Soil Conservation Service  
Department of Interior  
Bureau of Reclamation  
Indian Service  
Geological Survey  
National Park Service  
Department of Commerce  
Weather Bureau  
War Department  
Army Engineer Corps

#### PUBLIC UTILITIES

Colorado Public Service Company  
Western Colorado Power Company  
Montana Power Company  
Denver and Rio Grande Western R. R. Company

#### MUNICIPALITIES

City of Bozeman  
City of Denver  
City of Boulder

#### WATER USERS ORGANIZATIONS

Poudre Valley Water Users' Association  
Arkansas Valley Ditch Association  
Colorado River Water Conservation District

#### IRRIGATION PROJECTS

Farmers Reservoir and Irrigation Company  
San Luis Valley Irrigation District  
Santa Maria Reservoir Company  
Costilla Land Company  
Uncompahgre Valley Water Users' Association  
Wyoming Development Company  
Goshen Irrigation District  
Kendrick Project  
Pathfinder Irrigation District  
Salt River Valley Water Users' Association  
San Carlos Irrigation and Drainage District  
Twin Lakes Reservoir and Canal Company

Many other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

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RECORD  
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U. S. DEPARTMENT OF AGRICULTURE